

Application No. 10/607,751
Amendment Dated December 28, 2004
Reply to Office Action of September 3, 2004

REMARKS/ARGUMENTS

Claims 1-23 are pending, with Claims 1, 7, 13 and 19 independent. By this Amendment, Claims 1, 7 and 12 are amended and Claims 13-23 are added. No new subject matter is added by this Amendment. Reconsideration in view of the foregoing amendments and the following remarks is respectfully requested.

Except as indicated in the remarks set forth below, the amendments to the claims are made for the purpose of addressing informalities and improving the clarity of the claims, and are not required to overcome any prior art cited by the Office Action

35 U.S.C. §103 REJECTIONS

Claims 1-4 and 7-10

Claims 1-4 and 7-10 stand rejected under 35 U.S.C. §103(a) over Yoshida et al. (EP 0296822) in view of Kasten (U.S. Patent No. 6,114, 858). This rejection is respectfully traversed for at least the reasons set forth below.

The Examiner admits that Yoshida does not disclose a sine wave as the signal inputted and a level meter determining the power level, and asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made for Yoshida to use a level meter for determining power as well as inputting a sine wave into the electronic object as taught by Kasten in order to provide at least two test signal frequency bands. However, Applicants respectfully submit that the teachings of Yoshida and Kasten would not have resulted at least in inputting an unmodulated sine signal into the electronic object as recited in Claim 1, and an unmodulated sine signal which is to be input into the object to be measured, as recited in independent Claim 7.

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Yoshida and Kasten differ from the claimed invention in that the claimed input signal is an unmodulated sine signal (e.g., a pure sine signal with a discrete frequency). Kasten teaches an input sine signal that is modulated by a modulator 22 before being input to the device under test (DUT) 26. As agreed to by the Examiner, Yoshida does not teach a sine wave signal. In addition, the input signal in Yoshida is demodulated before being input to an AD converter 1. Therefore, neither Yoshida nor Kasten teach an unmodulated sine signal inputted into an electronic object to be measured, as recited in independent Claims 1 and 7. Accordingly, the combination of Yoshida and Kasten would not have resulted in the claimed features.

Regarding Claims 4 and 10, Applicants respectfully submit that the combination of Yoshida and Kasten would not have resulted in the recited estimation and a revision of a deviation of a frequency of the input sine signal from a frequency of an available local oscillator in the level meter. In Yoshida, the signal prior to averaging in the first averaging step is detected, as the signal's magnitude is used for averaging. The detected signal spectrum is centered around zero, and the exact knowledge of the signal center frequency is not required. The only requirement is that the test carrier frequency falls within the pass band of a band pass filter. In contrast, the signal samples of the preferred embodiments are still complex valued. The signal frequency must be exactly known, and hence, an estimation is recited in Claims 4 and 10. With the frequency at hand, the signal is demodulated, meaning that the remaining residual signal frequency is reduced. Thus, the signal power can be estimated by simply averaging complex valued samples.

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Therefore, Yoshida does not teach an estimation and a revision of a deviation of the input sine signal frequency from a frequency of an available local oscillator in the level meter at least because in Yoshida, the signal prior to averaging is detected, not estimated. Kastern does not teach the recited features relied upon but missing in Yoshida. Accordingly, the combination of Yoshida and Kasten would not have resulted in the features recited in Claims 4 and 10.

As discussed above, Yoshida and Kasten do not teach an unmodulated sine signal inputted into the electronic object, as recited in independent Claims 1 and 7. Claims 2-4 and 8-10 depend from one of the independent Claims 1 and 7, and are also believed to be allowable. In addition, the combination of Yoshida and Kasten would not have resulted in carrying out an estimation and a revision of the deviation of the input sine signal frequency from a frequency of an available local oscillator in the level meter, as recited in Claims 4 and 10. Withdrawal of the rejection of the claims under 35 U.S.C. §103 is respectfully requested.

Claims 5, 6, 11 and 12

Claims 5, 6, 11 and 12 stand rejected under 35 U.S.C. §103(a) over Yoshida in view of Kasten, and further in view of the alleged admitted prior art. This rejection is respectfully traversed for at least the reasons set forth below.

Regarding Claims 5 and 11, the Examiner admits that Yoshida and Kasten do not teach that the magnitude of a noise is the noise temperature T_{DUT} of the object to be measured, wherein the noise temperature is determined by the formula set forth in the claims. The Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made for Yoshida and Kasten to incorporate the teaching of the admitted prior art and determine

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the noise temperature after measuring separately the noise and power of the sine. The Examiner's assertions are respectfully traversed.

Regarding Claims 5 and 11, Applicants respectfully submit that while DE 41 22 189 discloses a formula that is based on two measurements or experiments, these measurements differ significantly. In DE 41 22 189, the device under test is not in the measurement's chain and the formula is a combination of formulas that describe the two different experimental settings. In addition, the formula can be considered to express the result of one experiment wherein one measurement is dedicated to obtain calibration information on the level meter, and the other measurement is dedicated to finally obtain the noise temperature or level of the DUT. However, in the claimed invention, only one measurement is conducted with the presumption that the noise level in the level meter is negligible with respect to the noise level in the DUT.

Moreover, the formula in DE 41 22 189 is based on the measurement of output sine amplitudes, whereas the formula recited in Claims 5 and 11 provides an approximate value of T_{DUT} based on a noise power and signal amplitude measurement. See page 17, line 18 to page 18, line 4. In DE 41 22 189, all considered noise sources are implicitly handled whereas, with the claimed formula, an integrated noise figure for DUT and level meter is adopted.

Accordingly, the alleged admitted prior art does not teach this claimed feature missing in Yoshida and Kasten. In fact, Applicants respectfully submit that the Examiner has provided no basis for modifying the prior art to result in the features recited in Claims 5 and 11 other than the Applicants' disclosure, the consideration of which constitutes the impermissible use of hindsight. Applicants submit that the Examiner must provide a reference or teaching of the subject matter

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of Claims 5 and 11 and motivation to combine the teaching with Yoshida, Kasten and the alleged admitted prior art to establish a *prima facie* case of obviousness.

Regarding Claims 6 and 12, the Examiner admits that Yoshida and Kasten lack a calibration preceding the measurement in which the sine signal has a level identical to the measurement level; the sine signal being input directly in to the level meter by passing the object to be measured; and the magnitude of the noise temperature being determined by the formula set forth in the claims. The Examiner then asserts that it would have been obvious for Yoshida and Kasten to incorporate the teachings of the alleged admitted prior art by calibrating the sine signal to have the same level as the measured level and have the level meter directly connected to the sine signal source to measure the noise temperature to arrive at the equivalent of the Applicants' recited equation for noise temperature. These rejections are respectfully traversed.

The equation recited in Claims 6 and 12 is based on the measurement of sine signal magnitude and noise power of the signal, whereas the equation given in DE 41 22 189 is based on sine level measurements only. For the claimed formula, only two measurements must be conducted to obtain an exact noise temperature of the DUT. In contrast, four measurements must be carried out in DE 41 22 189. The claimed formula allows a very exact measurement (e.g., very sensitive due to the factor $1/k$) and much higher input power levels may be adapted than in DE 41 22 189.

Moreover, if the suggestion of the Examiner with respect to the adoption of the equation given in DE 41 22 189 in combination with the measurement procedures given in Yoshida or Kasten is applied, then one of ordinary skill in the art would implicitly acknowledge that P_{MESS} ,

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$\sin = P_{\text{MESS, noise}}$ which would not provide any advantage over or motivation for combining DE 41 22 189.

Applicant respectfully submits that the Examiner has provided no basis for modifying Yoshida and Kasten to provide the claimed formula other than Applicants' disclosure, the consideration of which constitutes the impermissible use of hindsight. Applicants submit that the Examiner must provide a reference or teaching of the subject matter and formula of Claims 6 and 12, and motivation to combine the teaching with Yoshida, Kasten and the alleged admitted prior art to establish a *prima facie* case of obviousness.

In summary, the Examiner has not provided a *prima facie* case of obviousness for rejecting Claims 5, 6, 11 and 12. Withdrawal of the rejection of the claims under 35 U.S.C. §103 is respectfully requested.

NEW CLAIMS

This Amendment adds new Claims 13 to 23. New Claim 23 is similar in part to former Claim 1, but recites features recited in Claim 4 (e.g., estimation and revision of the deviation of a frequency of the input sine signal). The feature concerning the separate determination of the sine power level and the noise power level is recited in Claim 14, which depends from independent Claim 13. Claims 15-18 add features as similarly recited in Claims 2, 3, 5 and 6, respectively. Independent Claim 19 includes the subject matter of former Claim 7 and adds the features recited in Claim 10. Claims 20-23 add features corresponding to Claims 8, 9, 11 and 12, respectively. Applicants respectfully submit that all of the new claims are allowable over the prior art for at least the reasons set forth above. In particular, none of the references teach the estimation and

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revision of a deviation of a frequency of the input sine signal from a frequency of an available local oscillator in the level meter, as recited in independent Claims 13 and 19.

CONCLUSION

For at least the reasons set forth above, it is respectfully submitted that the above-identified application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are respectfully requested.

Should the Examiner believe that anything further is desirable in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

CAESAR, RIVISE, BERNSTEIN,
COHEN & POKOTILOW, LTD.

December 28, 2004

Please charge or credit our Account
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entry and/or ensure consideration of
this submission.

By 
Michael J. Cornelison
Registration No. 40,395
Customer No. 03000
(215) 567-2010
Attorneys for Applicant(s)